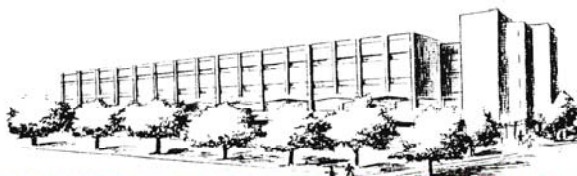


UNIVERSITY OF CONNECTICUT



**INSTITUTE OF MATERIALS SCIENCE**

## POLYMER PROGRAM SEMINAR

### “Nanostructure Application of Triptycene in Polyimide”

**Prof. Supakanok Thongyai**  
**Chulalongkorn University, Thailand**

**Friday, February 20, 2009**  
**11 AM, IMS Room 20**

A diamine monomer with a rigid structure, triptycene-2,5-diamine, was prepared from triptycene-2,5-dione by passing through triptycene-2,5-dioxime. This monomer was used as new monomer to prepare new polyimides containing triptycene unit by two-step polymerization method. The polyimides were synthesized using PMDA and 4,4'-ODA for the first system; BPDA and *p*-PDA for the second system; BTDA and 4,4'-ODA for the third system. Triptycene-2,5-diamine and another diamine (4,4'-ODA, or *p*-PDA) were condensed with dianhydride (PMDA, BPDA, or BTDA) in different monomer ratios of 0.625, 1.25, 2.5, 5 and 10 %mole of triptycene-2,5-diamine with mole ratio of dianhydride to diamine of 1:1 to give the highest molecular weight of polyimide in all systems. These new polyimides were preliminary characterized by FT-IR spectra which reveal the presence of triptycene unit in the polymer backbones. Thermogravimetric analysis indicated that the thermal degradation (Td5%) of triptycene/polyimide films were higher than pure polyimide but the contradict results were found in the second system. The organic triptycene monomer can elevate the decomposition temperature proportional to the higher concentration of triptycene, even if triptycene is not the inorganic materials. The glass transition temperatures of triptycene/polyimide films does not change when increase the concentration of triptycene diamine. The lowest dielectric constant at 2.95 can be found in the third system. The lower dielectric constants and density than the pristine polyimide were observed as a result of the higher free volume at the higher concentration of triptycene. The lower is the density, the higher is the free volume and the lower is the dielectric constant. Experimental results indicated that the triptycene/polyimide exhibited more solubility compare with pure polyimide.

*\*Coffee will be served at 10:45AM outside the seminar room.*

*\*For further information, please contact YH Chudy at 860.486.3582 of [yhchudy@ims.uconn.edu](mailto:yhchudy@ims.uconn.edu)*